

All in all, I did not add much that was new to Egypt, but I did marshal all the data and placed them in Egyptian and biogeographical context. And a very nice little book emerged (Larsen, T. B., 1990. *Butterflies of Egypt*. Apollo Books). The total number of species is only about 60. Many are migratory. I can see as many species during a good day in an African forest, but that does not detract from the biogeographical interest of the limited Egyptian fauna. The amount of cultural remains in Egypt, from the pyramids down, beggars belief – also off the tourist trail. The pleasure of the six week study tour was so great that I almost felt embarrassed when submitting my travel claim to the Carlsberg Foundation.– TORBEN B. LARSEN, UNDP Vietnam, c/o Palais des Nations, 1211 Geneva 10, Switzerland.

**A further note on the Sandhill Rustic *Luperina nickerlii* Freyer (Lepidoptera: Noctuidae) and its capacity to survive under sea water, with a note on the Flounced Rustic *Luperina testacea* (D. & S.) (Lepidoptera: Noctuidae) and other species**

The three British subspecies of the Sand-hill Rustic moth *Luperina nickerlii* Freyer all occur in coastal habitat where they can be exposed to submersion by the sea. *Luperina nickerlii demuthi* Goater & Skinner, is abundant on salt marshes in south-east England, where its habitat is often under water at high tide (Goater & Skinner, 1995. *Ent. Rec.* **107**: 127-131). *Luperina nickerlii gueneei* Doubleday, occurs on sand dunes on the coasts of North Wales and north-east England where inundation by salt water is occasional. *Luperina nickerlii leechi* Goater, occurs on an isolated shingle beach in Cornwall, where waves occasionally wash over the habitat in severe storm conditions.

It occurred to me these subspecies may be able to survive under water. In 2004, I tested the tolerance of *demuthi* to salt water immersion by placing four adult males on a tray of the larval foodplant, *Puccinellia maritima*, inside an aquarium and poured sea water slowly into the tank to replicate the rising tide, gradually submerging the *Puccinellia* and the moths, but leaving the highest stems out of the water. To my surprise, as the water rose one moth climbed up a tall *Puccinellia* stem and then crawled back down again a few centimetres under the water where it remained for the next 30 minutes. The moth appeared to be unharmed by the experience, although of course the submergence may have reduced its life expectancy (Spalding, 2006. *Ent. Rec.* **117**:269-271). I decided to repeat this experiment with both *gueneei* and *leechi*.

I placed 3 *gueneei* into the same tank, this time on the larval foodplant *Elytrigia juncea* growing in tubs, and then repeated the experiment with 4 *leechi*. In contrast to my experiment with *demuthi*, all these moths were female and as a result probably less flighty. The water temperature was 19°C. At all times *Elytrigia* stems were available above the water level so that the moths could stay above the water. As the level of the sea water rose in the tank, I made the following observations:

### 1. *Luperina nickerlii gueneei*

Moth 1 – became active as the water rose and then swam vigorously in a straight line on the surface of the water across the tank by rapid movement of its legs (**see photo**). (The reader might like to see a video of this on the web site [www.sandhillrustic.com](http://www.sandhillrustic.com)).

Moth 2 – when the water reached this moth, it crawled down the stem where it stayed for about 1 minute, then crawled above the water, then down again where it walked round the edge of the flower tub for 3 minutes (**see photo**) before floating to the surface again. It then swam vigorously round in circles.

Moth 3 – dropped into the water, swam around and then climbed up a separate *Elytrigia* stem.

### 2. *Luperina nickerlii leechi*

Moth 1 – immediately moved under water then floated to the surface again. It swam on the water surface and then climbed down a stem where it remained head down under water for 7 minutes; after this time it moved further down where it stayed under a grass blade until I drained the tank 1 hour later.

Moth 2 - moved under water then up again before moving partly under for 2 minutes, then becoming fully submersed for 13 minutes. It then floated to the surface, climbed back down the stem, floated up again when it tried walking on the sand, then moved down again before floating to the surface and started swimming. Then it moved down again into the water where it stayed for 38 minutes until I drained the tank.

Moth 3 – moved down the grass stem (**see photo**) and stayed head down under water.

Moth 4 – floated on the surface of the water for 1 hour.

None of the moths appeared to be harmed by the experience. The Irish subspecies *Luperina nickerlii knilli* Boursin occurs on sandy cliffs; if these cliffs are inundated as a result of climate change then we are all in trouble!

### 3. *Luperina testacea* (D. & S.)

I repeated the experiment with the Flounced Rustic, the only other *Luperina* species resident in Britain. This time, the moths were very flighty and moved off as soon as the water reached them. They are able to swim rapidly, rather like *nickerlii* though perhaps not as quickly.

Moth 1 - moved down a stem and stayed 4 cms below the water level (see photo)

Moth 2 – remained in position as the water rose above it

Moths 3 & 4 – flew off as the water rose

### 4. Other species

I repeated the same experiment with five other moth species (taken at random from my moth trap), using a single specimen of each.

*Diachrysis chrysitis* L. Burnished Brass – flew off as the water rose.



*Luperina nickeritii gueneei* under water.



*Luperina nickeritii gueneei* 'swimming'.



*Luperina nickeritii gueneei* going under water.



*Luperina testacea* under water.

*Ptilodon capucina* Fabricius Coxcomb Prominent - flew off as the water rose; I later found this moth floating dead on the water's surface.

*Acrionicta rumicis* L. Knot Grass – stayed stationary as the water level rose and only moved when partially submerged then swam across the surface of the water but not as rapidly nor as “purposefully” as *nickerlii*. Later found dying half-submerged.

*Xestia c-nigrum* L. Setaceous Hebrew Character – flew off as the water rose; later found floating on the water's surface.

*Abrostola tripartita* Hufnagel The Spectacle – flew off as the water rose.

*Luperina nickerlii* is able to swim rapidly in a straight line on the surface of the water and readily crawls below the water surface; submersion for up to one hour appeared to cause no harm to any individual. In some cases a film of air forms on the surface of the abdomen. It may be thought that this ability to move on and under water is an adaptation to occasional submergence by high tides, but the same ability to cope with water appears to be found in *Luperina testacea*, which is typically a species of grassy areas (often on the coast, but also inland), although this species is more flighty and apparently less proficient at swimming. None of the other species in this small sample moved below the surface of the water; although the Knot Grass swam across the water, the movement was hesitant and clumsy and gave no indication that the moth was accustomed to water; three of the species (Coxcomb Prominent, Knot Grass and Setaceous Hebrew Character) appeared to be harmed by water.— ADRIAN SPALDING, Tremayne Farm Cottage, Praze-an-Beeble, Camborne, Cornwall. TR14 9PH.

### ***Simulium (Nevermannia) cryophilum* (Rubtsov) (Dip.: Simuliidae) discovered at high tide mark in Fife**

Prospecting for blackflies (Diptera: Simuliidae) in the Scottish Kingdom of Fife during May 2006, small burns were examined for the presence of simuliid larvae and pupa. Ten kilometres south-east of St Andrews, Cambo Burn passes through the woodland of Cambo House and out into the sea (O. S. grid reference NO 608117). On 17.v.2006, nine *Simulium cryophilum* larvae along with two pupal cases of the *Simulium ornatum* group were collected from vegetation lying in the stream; accessed near the shore but still under the canopy of the trees. After the vegetation had been cleared of simuliids, I followed the burn out onto the beach. Wondering whether larvae would venture this far I spotted a dark speck atop a stone exposed above the water level. Closer examination revealed a pupa of *S. cryophilum* (**Fig. 1A**). The site was 92 metres from the initial collection point and in line with the high tide mark indicated by the driftwood and other flotsam and jetsam littering the shore (**Fig. 1B**). Examining other stones, a single larva of indeterminate species was found along with a *S. cryophilum* pupal case, the latter signifying successful emergence of an adult. Blackflies inhabit freshwater lotic environments and are not associated with brackish waters of marshes and coastal estuaries. Simuliids appear intolerant of